



Economic Impact Analysis Virginia Department of Planning and Budget

9 VAC 5-20 and 9 VAC 5-40 – VOC Emission Standards

Department of Environmental Quality

February 20, 2004

The Department of Planning and Budget (DPB) has analyzed the economic impact of this proposed regulation in accordance with Section 2.2-4007.G of the Administrative Process Act and Executive Order Number 21 (02). Section 2.2-4007.G requires that such economic impact analyses include, but need not be limited to, the projected number of businesses or other entities to whom the regulation would apply, the identity of any localities and types of businesses or other entities particularly affected, the projected number of persons and employment positions to be affected, the projected costs to affected businesses or entities to implement or comply with the regulation, and the impact on the use and value of private property. The analysis presented below represents DPB's best estimate of these economic impacts.

Summary of the Proposed Regulation

The General Assembly mandates in §10.1-1308 of the Code of Virginia that the State Air Pollution Control Board promulgate regulations abating, controlling, and prohibiting air pollution throughout or in any part of the Commonwealth.

The proposed regulatory action adds a new section to existing regulations for the control and abatement of air pollution. It establishes new emission limits for consumer products ranging from cosmetics and antiperspirants to aerosol adhesives and charcoal lighter fluids. It also establishes a number of administrative and other requirements to be met by manufacturers of these consumer products. The new standards and requirements being proposed only apply to persons and sources in the Northern Virginia volatile organic compounds (VOC) emissions control area (Counties: Arlington, Fairfax, Fauquier, Loudoun, Prince William, and Stafford; Cities: Alexandria, Fairfax, Falls Church, Manassas, and Manassas Park). The compliance deadline is established as January 1, 2005.

Estimated Economic Impact

Rationale:

The federal Clean Air Act requires the Environmental Protection Agency (EPA) to prescribe primary and secondary air quality standards (developed for the protection of public health and public welfare, respectively) for each air pollutant for which air quality criteria were issued before the enactment of the Clean Air Act in 1970. These standards are known as the national ambient air quality standards (NAAQS) and they establish the maximum limits of pollutants that are permitted in the outside ambient air.

The Clean Air Act also requires each state to adopt and submit to EPA a plan (the state implementation plan or SIP) that provides for the implementation, maintenance, and enforcement of NAAQS within each air quality control region in the state. The Clean Air Act establishes a process for evaluating air quality in each region and identifying and classifying non-attainment areas according to the severity of the air pollution problem. Non-attainment areas are classified as marginal, moderate, serious, severe, and extreme and subject to more stringent measures as the classification moves from marginal non-attainment to extreme non-attainment. The Clean Air Act requires EPA to propose geographic boundaries and pollution classification levels for all non-attainment areas in each state based on air quality data from that state. Following the establishment of non-attainment areas, each state is then required to submit a SIP demonstrating how it intends to achieve NAAQS in each non-attainment area. The SIP specifies how the state intends to reduce air pollution concentrations to a level at or below these standards. Once the pollution levels are at or below NAAQS levels, the SIP also demonstrates how the state intends to maintain air pollution concentrations at the reduced levels.

Effective July 1, 2003, parts of northern Virginia were classified as severe non-attainment areas for ozone and its precursors, volatile organic compounds or VOCs. The Northern Virginia VOC emissions control area includes the counties of Arlington, Fairfax, Fauquier, Loudoun, Prince William, and Stafford and the cities of Alexandria, Fairfax, Falls Church, Manassas, and Manassas Park. The area was classified as a severe non-attainment area following deterioration in air quality and change in the federal ozone standard. The changes being proposed are additional measures to be incorporated into the SIP to bring VOC emissions to a level at or below NAAQS for ozone in northern Virginia. Failure to prepare such a plan and/or failure to

obtain EPA approval for such a plan could result in sanctions such as the loss of federal funds for highways and other projects and EPA promulgating and implementing an air quality plan for Virginia.

Description of the Regulation and Estimated Economic Impact:

The proposed regulatory action adds a new section to the existing regulation for the control and abatement of air pollution. The new section is intended to limit VOC emissions from consumer products. The requirements of the section apply to all individuals and businesses manufacturing, selling, or supplying consumer products containing VOCs in the northern Virginia VOC emissions control area. Some of the exemptions to the rule are manufacturers and distributors who can demonstrate that the consumer product is for sale or shipment outside the Northern Virginia VOC emissions control area and that they have taken reasonable precautions to prevent its distribution in northern Virginia, fragrances up to 2% by weight contained in a consumer product, adhesives sold in containers of one fluid ounce or less, and fresheners and insecticides containing at least 98% paradichlorobenzene.

The proposed regulatory action establishes VOC emission limits for consumer products ranging from antiperspirants and cosmetics to aerosol adhesives and charcoal lighter fluids. Apart from ensuring that their products comply with the VOC emission limits, manufacturers are also required to date-code all consumer products subject to this regulation. They are also required to meet some additional record-keeping requirements such as retaining all documents related to the alternative control plan (ACP) agreement¹ for at least three years and providing the State Air Pollution Control Board with any documentation related to the ACP product within 90 days of the request. In addition, manufacturers of aerosol adhesive products are required to meet labeling requirements specified in the regulation. In the case of innovative products, the regulation allows manufacturers to seek and be granted an exemption from the requirements of the regulation.

The proposed regulatory action allows for the issuance, use, and trading of surplus reduction credits. The State Air Pollution Control Board will issue surplus reduction certificates to manufacturers operating under an ACP agreement based on the emission reductions achieved

¹ An ACP agreement allows manufacturers to sell consumer products in the Northern Virginia VOC emissions control area as long as they meet the requirements of the proposed regulatory action.

by the manufacturer greater than those required by the established limits. Manufacturers generating surplus emission reductions can use their surplus reduction certificates against future emission exceedances or sell their certificates to small or one-product businesses operating under a consumer products ACP. The regulation also provides for limited-use surplus reduction credits for early reformulation of ACP products. These limited-use credits can only be used by the manufacturer of the consumer product and cannot be traded. Allowing for trading of surplus reduction credits is likely to encourage manufacturers to achieve emissions reduction in excess of that required by regulation and mitigate some of the compliance costs associated with this regulation.

The proposed regulatory action establishes test methods and procedures to be used to determine compliance with the requirements of the consumer products rule. Alternative test methods can be used, but only after they have been approved by the State Air Pollution Control Board. The regulation also establishes a number of administrative requirements. It specifies procedures and requirements for the granting of waivers by the State Air Pollution Control Board. It also establishes procedures and requirements dealing with an ACP for consumer products. These include when manufacturers are required to submit an ACP, the procedure for submitting and maintaining an ACP, what constitutes a violation of the ACP agreement (or of the regulation), and the procedure for modifying, canceling, or transferring an ACP.

Finally, in order to take into account the new standards and requirements being proposed, the proposed regulatory action incorporates by reference the relevant documents and parts of the Code of Federal Regulations.

The standards being proposed are identical to those in the model rules established by the Ozone Transport Commission (OTC)² and standards implemented by other states such as California. According to a study by the OTC³, the California Air Resources Board estimated the cost of compliance with their consumer product rule to be \$800 per ton of VOC reduced. However, because more products fall under the ACP in the OTC area than in California, the compliance costs are spread over a larger portion of sales in the OTC than in California. Thus,

² The OTC was formed by Congress in 1990 to help coordinate plans for reducing ground-level ozone in the Northeast and mid-Atlantic states. Twelve states including Virginia are represented in the OTC.

³ E. H. Pechan and Associates, 2001. Control Measure Development Support Analysis of Ozone Transport Commission Model Rules. *Report prepared for the Ozone Transport Commission.*

the costs incurred by manufacturers in the supplying consumer products to the OTC area are expected to be lower than \$800 per ton. The OTC report estimates that the model rule benefit for northern Virginia is VOC emissions reduction of 3 tons per day. Daily VOC emissions reductions of 3 tons would mean annual VOC emissions reductions of 1,095 tons. At \$800 per ton of VOC reduced, the proposed change would cost an estimated \$876,000 on an annualized basis.

DEQ has proposed the above rule, along with several other control measures, as a possible means by which to reduce VOC emissions in the Northern Virginia VOC emissions control area. The Metropolitan Washington Air Quality Committee (MWAQC)⁴, based on projected future emissions and other regional data, determined that the proposed measures were necessary for the area to meet its emissions reductions and attainment requirements. MWAQC decided on January 23, 2002 that Washington, D.C., Maryland, and Virginia would adopt the proposed measures. On August 19, 2003, the MWAQC approved the submitted plan for the attainment and maintenance of ozone air quality standard in the Northern Virginia area. The proposed regulatory action is part of the plan approved by the MWAQC. Maryland and Washington, D.C. are in the process of promulgating and adopting a similar rule. Many states in the Northeast and the mid-Atlantic regions have promulgated or are in the process of promulgating a regulation along the lines of the regulation being proposed in Virginia, so much so that the OTC produced a study providing estimates of the emissions reductions for each state within the OTC jurisdiction associated with the implementation of the rule (based on current federal and state regulations and SIP assumptions) as well as the costs associated with implementing the rule.

DEQ estimates that the proposed regulatory action will affect 193 manufacturers of consumer products. Once full emissions reductions are achieved, the annualized cost associated with implementing the consumer products rule is \$876,000. DEQ expects that full reductions for the consumer products rule will most likely be achieved within a year of the effective date of the rule.

⁴ A body of locally affected officials certified by the mayor of Washington, D.C. and the governors of Maryland and Virginia to prepare an air quality plan for the DC-Maryland-Virginia metropolitan statistical area

Implementing the proposed changes will also result in some economic benefits. The adoption of this rule is likely to reduce emissions of VOCs in the Northern Virginia VOC emissions control area. The emissions reductions are likely to be beneficial to public health and welfare. According to EPA, exposure to ozone at the ground level can cause a number of respiratory problems such as irritation of the respiratory system, reduced operation of the lungs, inflammation and damage to the cells lining the lungs, and aggravation of existing lung problems. Repeated ozone exposure can cause permanent damage to children's developing lungs and accelerate the decline in lung function with age in adults. According to the U.S. Global Change Research Program, the best estimate of human health effects of ground-level ozone in the United States over the past 15 years is approximately \$7 billion per year. Thus, reducing the level of ozone will provide economic benefits in the future in terms of respiratory health problems and fatalities prevented (reflected in lower health care and other costs) and increased productivity because of lower amounts of ground-level ozone. The emissions reductions achieved by the implementation of this rule would also help Virginia avoid federal sanctions that would be imposed for violating the SIP provisions of the Clean Air Act. The sanctions include the loss of federal funds for highways and other projects and/or more restrictive requirements for new industries. Moreover, the lack of an acceptable plan to get VOC emissions below NAAQS could also result in EPA promulgating and implementing an air quality plan for Virginia. Implementing the proposed rule would produce economic benefits by allowing Virginia to continue to receive federal funds and letting Virginia run its own air quality program.

The net economic impact of the proposed regulatory action will depend on whether the economic benefits of implementing these rules is greater than or less than the costs of doing so. The estimated cost of the proposed regulatory action is approximately \$876,000. It is not possible at this time to estimate the number and severity of respiratory problems and fatalities that will be prevented as a result of implementing these regulations. The extent of federal funding retained as a result of implementing the proposed regulatory action is also not known. Moreover, there are no studies or data available at this time estimating the economic benefits of having air quality programs run by states rather than by the federal government. Even with the uncertainties involved in determining the precise economic benefits of the proposed rule, the

costs associated with implementing the rule appear to be relatively small. Thus, it is likely that these costs will be outweighed by the benefits of implementing the proposed rule.

The above analysis is based on the assumption that the rule will be adequately implemented and enforced. Enforcement is a key component of the proposed rule and essential to ensuring that emissions reduction targets are met. One of the causes for concern is the bootlegging of products not meeting the Voc emissions limits from other parts of the state into the Northern Virginia VOC emissions control area. Manufacturers are likely to incur additional costs in reformulating consumer products to meet the prescribed VOC emissions limit. Some or all of these costs are likely to be passed on to consumers in the form of higher prices. Without adequate enforcement and a large enough price differential between consumer products sold in Northern Virginia and elsewhere, the issue of bootlegging is likely to become significant. Another cause for concern is the operation of the surplus trading scheme. The regulation does not provide any details about how the scheme is to operate. The surplus trading is intended to encourage larger manufacturers to reformulate products to below the emissions limits established in the regulation. At the same time, it is also intended to provide smaller manufacturers (for whom reformulation is a more expensive proposition) with an option of continuing to manufacture products that do not meet the emissions limits as long as they have the requisite number of credits. By not implementing the surplus trading scheme effectively, the proposed rule will not be able to reap all the intended benefits.

According to DEQ, the agency currently does not anticipate using any additional resources reviewing and approving ACPs. However, DEQ does plan to resolve any enforcement and implementation issues by 2007, when the last of the products not meeting the emissions limits are to be phased out.

Alternative to the Proposed Regulatory Action:

Alternatives to the proposed regulatory action considered by DEQ were to take no action or to make alternative regulatory changes to those required by provisions of the law and associated regulations and policies. Other means of meeting the stated purpose of the regulation were deemed more burdensome and intrusive than the proposed change. Market-based mechanisms such as emissions cap-and-trade programs were not explicitly stated as an alternative considered by DEQ. Such programs exist for reducing emissions of air pollutants

such as nitrogen oxides (NO_x), sulfur dioxide, and VOCs at the federal and state level. In fact, Virginia is currently implementing an emissions allowance-trading program for new sources producing NO_x emissions. §10.1-1322.3 of the Code of Virginia authorizes DEQ to consider market-based mechanisms as an option when formulating regulatory actions for achieving and maintaining NAAQS.

The proposed consumer product rule is the fifth rule proposed in the last year to reduce VOC emissions in the Northern Virginia VOC emissions control area. The other four rules dealt with controlling VOC emissions from portable fuel containers, mobile equipment repair and refinishing operations, architectural and industrial maintenance coatings, and solvent metal cleaning operations. Rather than implementing numerous such rules, which are costly to implement and enforce and whose benefits are relatively small, market-based mechanisms such as emissions cap-and-trade programs have frequently been demonstrated to be a more cost effective way of achieving the desired emission reductions. According to EPA, cap-and-trade is a policy approach for controlling large amounts of emissions from a group of sources at lower cost than if the sources were regulated individually. The approach first sets an overall cap, or maximum amount of emissions per compliance period, that will achieve the desired environmental effects. Authorizations to emit in the form of emission allowances are then allocated to affected sources, and the total number of allowances cannot exceed the cap. Individual control requirements are not specified for sources. The only requirements are that sources completely and accurately measure and report all emissions and then turn in the same number of allowances as emissions at the end of the compliance period.

The market-based emissions reduction program implemented in the Chicago ozone non-attainment area is the closest model of a program that could be applied to the Northern Virginia VOC emissions control area. The Chicago ozone non-attainment area has an emissions allowance-trading program that covers a large number of sources producing VOC emissions in the region. Parts of northern Illinois in and around Chicago have been classified by EPA as severe ozone non-attainment area. Under provisions of the federal Clean Air Act, the area must attain NAAQS by 2007. Illinois already has a number of technology-based or command and control rules, similar to those being proposed in Virginia, to limit VOC emissions from stationary sources. In order to meet the additional VOC emissions reductions required by the

federal Clean Air Act for the Chicago ozone non-attainment area, Illinois considered the implementation of further command and control measures. However, because the less expensive command and control rules had already been implemented, the only options available were rules with a very high cost of implementation.

In order to minimize the cost of further VOC reductions, Illinois chose instead to pursue a market-based approach to reducing VOC emissions. The emissions reduction market system (ERMS) was introduced in 2000. The ERMS is a cap-and-trade program in which participating sources must hold trading units equivalent to their VOC emissions. Each participating source is given a baseline depending on their actual VOC emissions in previous years adjusted for their compliance or noncompliance with existing rules. They are then issued trading units based on their baseline and adjusted for a 12% reduction in VOC emissions. Exceptions are provided for some sources for which emissions cannot be further reduced. Including exceptions and contingencies the program is expected to produce an overall VOC emissions reduction of 9% compared to the baseline. The ERMS operates from May 1 to September 30 (the time ground-level ozone formation is at its maximum) and trading units are retired after each season in order to account for each source's VOC emissions during the season. Thus, participating sources can either limit their emissions (through emissions controls or changes in technology) to the number of trading unit allotted to them or buy additional trading units from other sources in order to cover their excess emissions. Total VOC emissions are capped by the number of trading units issued. Even while participating in the program, ERMS participants are subject to all existing state and federal rules to limit VOC emissions.

The ERMS has been operating for four years and appears to be meeting its emissions reduction objectives. In 2002, there were 172 participating sources (excluding exempt sources) in the ERMS program. According to the annual performance review report for 2002, the ERMS program has achieved desired emissions reductions. In fact participating sources were found to be performing significantly below the baseline and allotment levels (allotments show a 9.7% and 9.9% reduction from the original baseline for all participating sources in 2002 and 2001, respectively). Moreover, the report found that the market-based system operated effectively with sources able to find trading partners (there was a sufficient supply of available trading units and market prices were conducive to trading).

Market-based emissions reduction programs have several economic advantages over technology-based command and control regulations. (i) They increase the flexibility of affected sources in meeting the emissions reduction requirements. Sources can still choose to limit their emissions by placing emission controls and through changes in technology. In addition, under a market-based program, sources facing high cost options to limit their emissions can trade with other sources not using all of their allotted trading units or facing less costly ways of lowering their emissions. Sources not currently using their entire allotment of trading units will be able to receive compensation for surplus trading units that would otherwise have been worthless, sources exceeding their allotment will be able to continue to emit VOCs, and the entire area would continue to meet its aggregate emissions reduction target. Moreover, sources with low cost options for reducing emissions will have an incentive to reduce their VOC emissions and sell the surplus trading units to other sources that would otherwise have to spend more money to reduce their own emissions. Thus, implementation of a market-based program provides more flexibility to sources emitting VOCs to choose the most cost-effective method of meeting emissions reduction targets and creates incentives for the adoption of low-cost emissions reduction technologies. (ii) Market-based programs are more likely to result in actual VOC emissions reductions than technology-based measures. A major problem with technology-based command and control measures has been enforcement. Better enforcement of emissions reduction targets is likely to lead to the attainment of NAAQS in a shorter time and produce economic benefits by reducing the number and severity of illnesses and fatalities from exposure to ground-level ozone. By requiring sources to monitor and report their emissions and by basing trading unit allotments on these emissions, a cap-and-trade program reduces the incentive for non-compliance and thus increases the chances for actual emissions reductions. According to an EPA analysis of the federal sulfur dioxide cap-and-trade program (or the acid rain program), compliance has been at a near-perfect 99%. Reductions in the early years of the program were 25% below allowable levels. In fact, according to EPA, the federal sulfur dioxide cap-and-trade program has achieved greater emissions reductions in the given time than any other single program to control air pollution. (iii) Market-based programs also tend to be less expensive to implement than technology-based command and control measures. The operation and design of market-based programs such as cap-and-trade programs are relatively simple and this helps keep compliance and administrative costs low. According to EPA, cost savings from implementing

cap-and-trade programs have been significant, as expensive source-specific reductions no longer have to be imposed and enforced on each source. The federal sulfur dioxide trading program ended up costing 75% less than the amount estimated before the program was implemented. Moreover, emissions monitoring and reporting requirements of market-based programs are not likely to be any more burdensome than similar requirements of most technology-based measures. (iv) The design of programs, such as the ERMS program, provides additional economic benefits over technology-based measures. The ERMS program is implemented only during the times of the year when ozone concentrations at the ground level are the highest, i.e., between May and September. By running the program only during these times, ERMS creates an incentive for sources to reschedule activities that produce VOC emissions to times of the year when the ozone concentration is lower. Thus, sources of VOC emissions will choose to engage in such activities during the high ozone times only if the economic benefits are greater than the costs associated with doing so. It is likely that some sources will choose to postpone these activities to another time of the year when the costs associated with engaging in them is lower. By ensuring, based on cost, that these activities are undertaken during different times of the year, the design of the ERMS program will produce efficiency gains.

Overall, market-based programs are more likely to produce actual emissions reductions than technology-based command and control measures, reducing the number and extent of illnesses and fatalities resulting from exposure to ozone. Moreover, the emissions reductions are likely to be achieved at a lower cost. Thus, market-based program for reducing emissions are likely to produce maximum benefits for public health and welfare and do so in the most efficient manner and with the least waste of resources.

In formulating a plan for the Northern Virginia VOC emissions control area, the Illinois cap-and-trade program should have been considered and analyzed extensively. The Chicago area has been classified as a severe ozone non-attainment area for some years now despite having technology-based rules similar to those in Virginia. In addition, the Chicago ozone non-attainment area also has regulations in place for portable gas can spillage control, solvent cleaning, mobile equipment repair and refinishing, and architectural and industrial maintenance coatings such as the ones being promulgated for the Northern Virginia VOC emissions control area. Despite all these measures, the Chicago area continues to have problems in meeting NAAQS for ozone. While differences in factors such as growth in population and the number

polluting industries located in the area may be an issue when evaluating the cost effectiveness market-based mechanisms for reducing VOC emissions, it is recommended that DEQ consider such programs for implementation in the Northern Virginia VOC emissions control area.

Businesses and Entities Affected

The proposed regulatory action will affect manufacturers of ACP consumer products supplying or selling these products in the Northern Virginia VOC emissions control area. DEQ estimates that the proposed regulatory action will affect 193 manufacturers of consumer products.

These manufacturers will now have to ensure that consumer products produced by them for sale in the Northern Virginia VOC emissions control area comply with the VOC limits specified in the regulation. They will also have to meet some additional requirements such as date-coding all consumer products subject to the regulation, maintaining and making available all records pertaining to the ACP agreement and the ACP product. Manufacturers of aerosol adhesive products will be required to meet labeling requirements specified in the regulation. Some of the cost associated with these additional requirements will be counter-balanced by the fact the regulation provides an exemption from the requirements of this regulation to manufacturers producing innovative products. In addition, the regulation also encourages emissions reductions in excess of the prescribed limits by allowing for the issuance, use, and trade of surplus reduction credits.

Localities Particularly Affected

The proposed regulation will only affect localities in the Northern Virginia VOC emissions control area consisting of the counties of Arlington, Fairfax, Loudoun, Prince William, and Stafford and the cities of Alexandria, Fairfax, Fauquier, Falls Church, Manassas, and Manassas Park.

Projected Impact on Employment

The proposed regulatory action is likely to have a negative impact on employment. Increasing the cost of operation for businesses manufacturing consumer products for sale in the Northern Virginia VOC emissions control area could result in people being laid off at these facilities.

Effects on the Use and Value of Private Property

The proposed regulatory action is likely to have a negative impact on the use and value of private property in the Northern Virginia VOC emissions control area. By imposing additional requirements on facilities manufacturing consumer products for sale in the Northern Virginia VOC emissions control area, the proposed regulatory action will impose additional costs and lower the asset value of these businesses. The proposed regulatory action is also likely to have a positive impact the use and value of private property. Due to a reduction in the amount of ground-level ozone in northern Virginia, some residential properties in the northern Virginia area could see an increase in their market value. However, it is not possible at this time to estimate the exact extent of the increase in market value of these properties resulting from a reduction in ground-level ozone.